

**Biological notes on *Lyonetia (Lyonetiola) castaneella* (Lepidoptera: Lyonetiidae), with a new hostplant from Japan**

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**Abstract** *Lyonetia (Lyonetiola) castaneella* Kuroko, 1964 was described and has been recorded based on only a small number of specimens from Fukuoka and Osaka Prefectures, Japan. Although the two hostplants, *Castanea crenata* and *Quercus acutissima*, are dominant in Japanese coppice, the biological data of the immature stages has been poorly known. This species is newly recorded from Nara and Mie Prefectures and *Carpinus tschonoskii* is newly recorded as the hostplant. Biological notes on the immature stages of the species are given with photographs for the first time.

**Key words** Betulaceae, *Castanea crenata*, *Carpinus tschonoskii*, leafminer, leaf mine, *Lyonetiola*.

**Introduction**

*Lyonetia (Lyonetiola) castaneella* Kuroko, 1964 was described based on specimens from Hikosan, Fukuoka Prefecture. Kuroko (1964) reported the biology of this species on the two hostplants, *Castanea crenata* and *Quercus acutissima*, Fagaceae. Later a small number of specimens of this species were collected in 1975 by Dr T. Saito in Minoo, Osaka, Japan and they were preserved in Osaka Prefecture University (OPU). Subsequently Kuroko (1982) added Osaka Prefecture as a new distributional locality of this species, and noted that it is not common. Since 1982, no additional data on this species has been reported in Japan. Recently, Baryshnikova (2007) newly recorded this species from the Russian Far East with a new hostplant, *Alnus japonica*, Betulaceae. But the biological data of the immature stages has been poorly known and no photographs or illustrations have been published until now. During August and October in 2015, I collected a brown blotch mine on the tips of leaves of *C. crenata* and *Carpinus tschonoskii* in Nara and Mie Prefectures. At first I considered them to be dead leaves, but lyonetiid larvae were observed in them and some adults of this species emerged later.

In this paper, biological notes on *L. castaneella*, the new hostplant and the immature stages are given with photographs for the first time. All specimens were deposited in the Entomological Laboratory, Osaka Prefecture University (OPU). Scientific names of plants follow the Missouri Botanical Garden Tropicos database (2015).

***Lyonetia (Lyonetiola) castaneella* Kuroko (Figs 1–5)**

*Lyonetia (Lyonetiola) castaneella* Kuroko, 1964: 16, pls 1, 3, 6, 12; Kuroko, 1982, **1**: 173; **2**: pl. 2: 33; Baryshnikova, 2007: 361, figs 2, 4.

Material examined. 6(2♂ 1♀ 3exs)

[Host: *Castanea crenata*]: 1♂ 1♀ 3exs, Kochi-bashi, Shorenji, Nabari, Mie Prefecture, 2, 5. x. 2015 em., S. Kobayashi leg., 22. ix. 2015(larva), genitalia slide no. SK557, 558.

[Host: *Carpinus tschonoskii*]: 1♂, Konagao, Soni, Uda, Nara Pref., 18. viii. 2015 em., S. Kobayashi leg., 15. viii. 2015(larva), SK554; Pupa: 3exs, same locality and data.

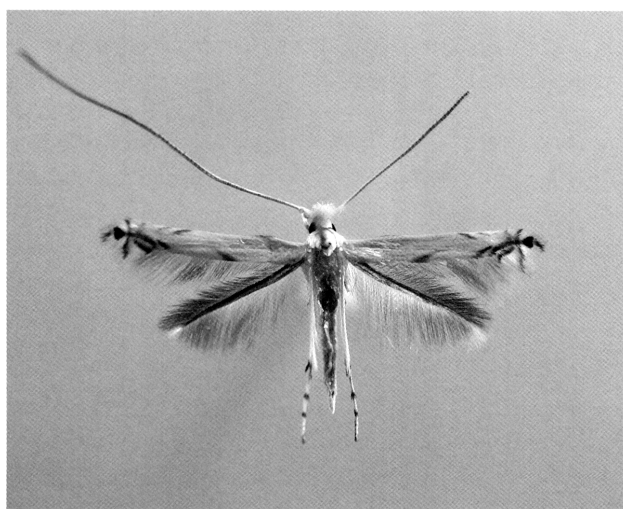


Fig. 1. Adult of *Lyonetia castaneella* Kuroko, 1964 (Mie Prefecture, Japan, Host: *Castanea crenata*).

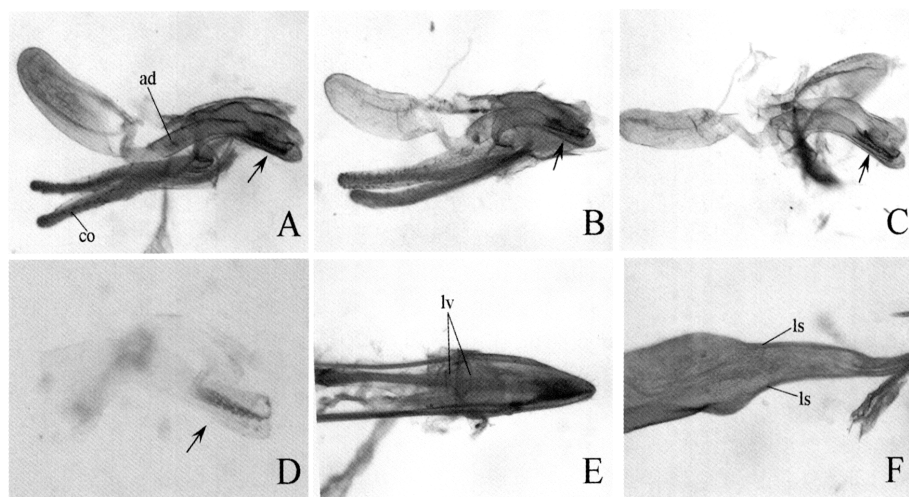


Fig. 2. The genitalia of *Lyonetia castaneella*. A–D: Male genitalia, lateral view. E–F: Female genitalia, ventral view, host: *Castanea crenata*. A: Host: *C. crenata*. B–C: Host: *Carpinus tschonoskii*. D: Paratype, preparation by Dr H. Kuroko, host: *Quercus acutissima*. A, C, D: Part of superuncus removed. Arrows show longitudinally scobinated area of aedeagus. Abbreviations: ad: aedeagus; co: coremata; ls: linear signum; lv: lamellae vaginales.

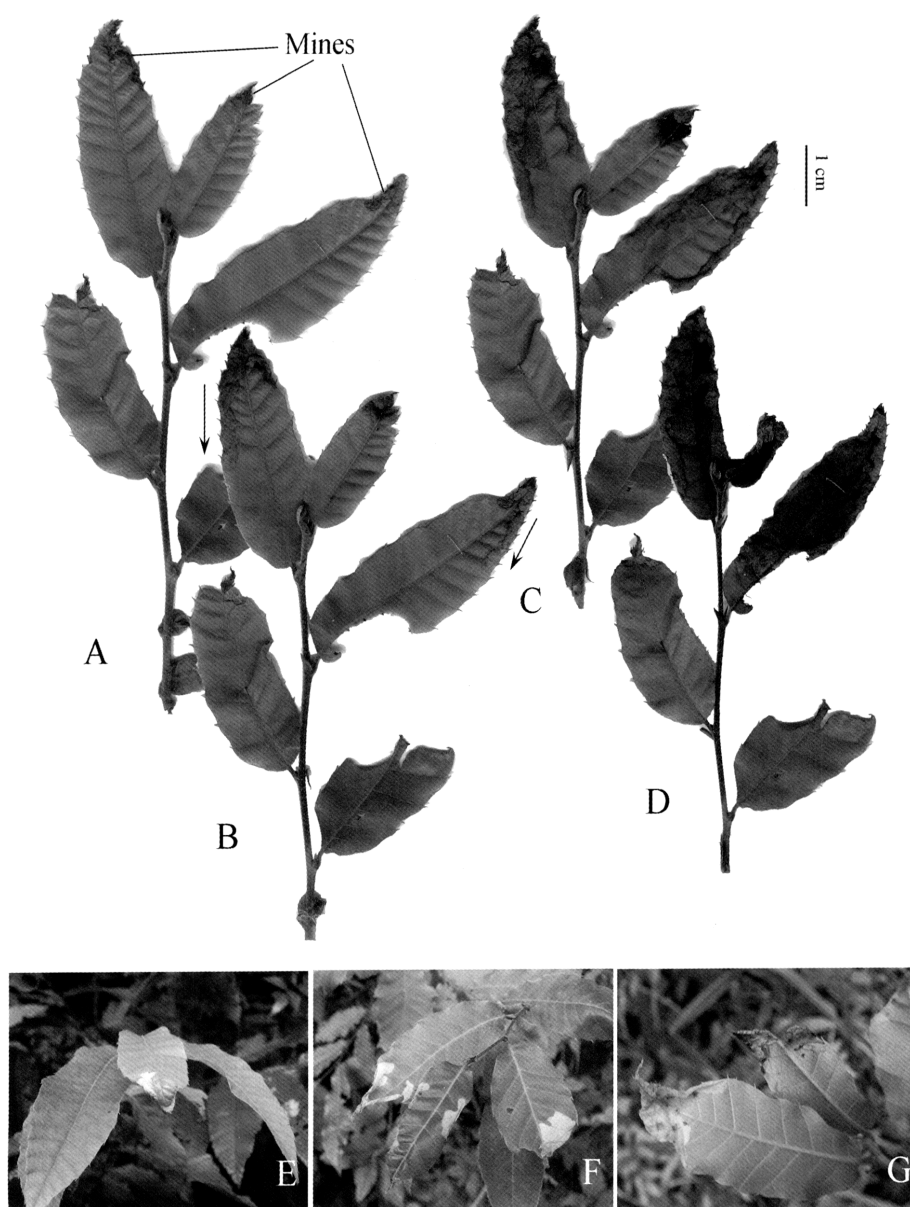


Fig. 3. Mines of *Lyonetia castaneella* and the hostplant, *Castanea crenata*. A–D: Mine developments by young to final instar larvae. A: Two days after collecting young mines (Fig. 4A). B: Three days after. C: Four days after. D: Six days after, larvae quit the mine and spin a cocoon on the outside. E: Young mine. F: Old mine. G: Old mine, abaxial side of leaves. Arrows show direction of larval transfer.

**Diagnosis.** The subgenus *Lyonetiola* comprises four species in Japan, i.e., *L. myricella* Kuroko, *L. euryella* Kuroko, *L. meridinana* Kuroko and *L. castaneella* Kuroko. The subgenus is characterized by the following characters: antenna about 1.5x length of forewing (Fig. 1), vein CuA<sub>1</sub> present in forewing, vein M<sub>2</sub> stalked with M<sub>1</sub> in hindwing, arms of gnathos widely separated in the male genitalia (Kuroko, 1964). This species is distinguishable from other congeneric species by a combination of the following characters: the 1st dorsal streak is present at 2/5 of the forewing and the oblique apical line is present in the apical cilia (Fig. 1), the aedeagus has a developed scobinate area; about 1/3 the length of the aedeagus in the male genitalia (Fig. 2A–C), the lamellae vaginales are rounded (Fig. 2E) and the ductus bursae has a round sclerotized patch in the female genitalia (Fig. 2F).

**Male genitalia** (Fig. 2A–D). See Kuroko (1964, fig. 38, 1982) and Baryshnikova (2007, fig. 2). In the original description, a longitudinally scobinate (=nodulated) area of the aedeagus is illustrated as being small, about 1/10 of the length of the aedeagus; it actually extends for about 1/3 of the length of the aedeagus (Fig. 2A–D).

**Female genitalia** (Fig. 2E–F). See Kuroko (1964, fig. 58, 1982) and Baryshnikova (2007, fig. 4).

**Host plants.** *Castanea crenata* Siebold & Zucc., *Quercus acutissima* Carruth. (Fagaceae) (Kuroko, 1964), *Alnus japonica* (Thunb.) Steud. (Baryshnikova, 2007), *Carpinus tschonoskii* Maxim. (new record) (Betulaceae)

**Distribution.** Japan: Honshu (Osaka (Kuroko, 1982), Nara and Mie Prefectures (new record)), Kyushu (Fukuoka Prefecture) (Kuroko, 1964); Russia (Southern part of Primorskii Territory) (Baryshnikova, 2007).

**Biology** (Figs 3–5). Kuroko (1964) recorded the biology of this species on *Castanea crenata* and *Quercus acutissima* (Fagaceae) and Baryshnikova (2007) newly recorded this species on *Alnus japonica* (Betulaceae). The larvae occur from the end of July to October in Japan (Kuroko, 1964) and the adults fly from July to August in the Russian Far East (Baryshnikova, 2007). In the present study, the larvae were observed from August to October in Nara and Mie Prefectures. All larvae were collected on shoots of the hostplant trees of about 1–3 m height (Fig. 5G, H), and mines were restricted to newly developing leaves (Figs 3A–E, 4A). The larva formed an irregular blotch mine on the young leaf; the mine starts near the tip, then widens downwards, the feeding area extending from half to the whole of the leaf, about 60~mm in length, 4~mm in width. Usually 1–2 mines were observed per leaf and 1–3 larvae were usually observed

per mine (Fig. 4D, F–H). The frass is partly ejected through holes in the mine (Fig. 4I, J), but deposited inside on *C. tschonoskii* (Fig. 4D, E, K). In the field, old mines were wrinkled and shrivelled up as dead leaves (Fig. 3E–G). The late and final instar larva is ~3.5–4.5, 6.0–7.0 mm long and yellowish green in coloration (Figs 4K, 5M). The larvae finished the mining stage in about six to seven days (larvae were collected on 22. ix. 2015 in Mie Prefecture) (Fig. 3A–D). The pupa was 6.8 mm long and yellowish green in coloration (Figs 4M, N, 5N, O).

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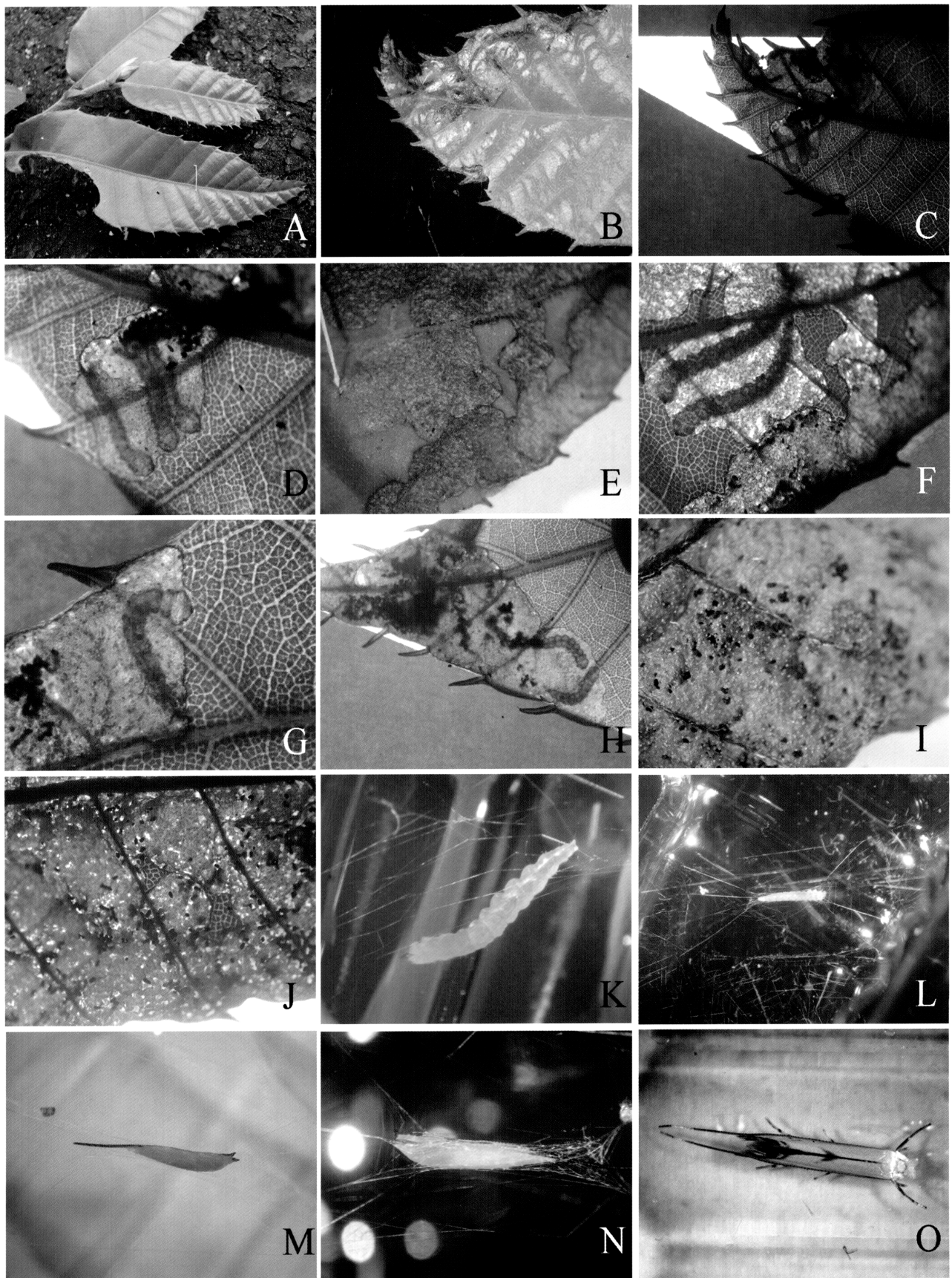


Fig. 4. Biology of *Lyonetia castaneella* and the hostplant, *Castanea crenata*. C, D, F-H, J: Pictures taken with transmitted illumination of microscope. A: Young mines. B, E: Blotch mine by later larvae. D, G, F-H: Later larvae and frass with blotch mines. I, J: Blotch mine with frass and holes to eject them. K, L: Final instar larva, spinning cocoon. M, N: Pupa and cocoon. O: Resting posture of the adult.



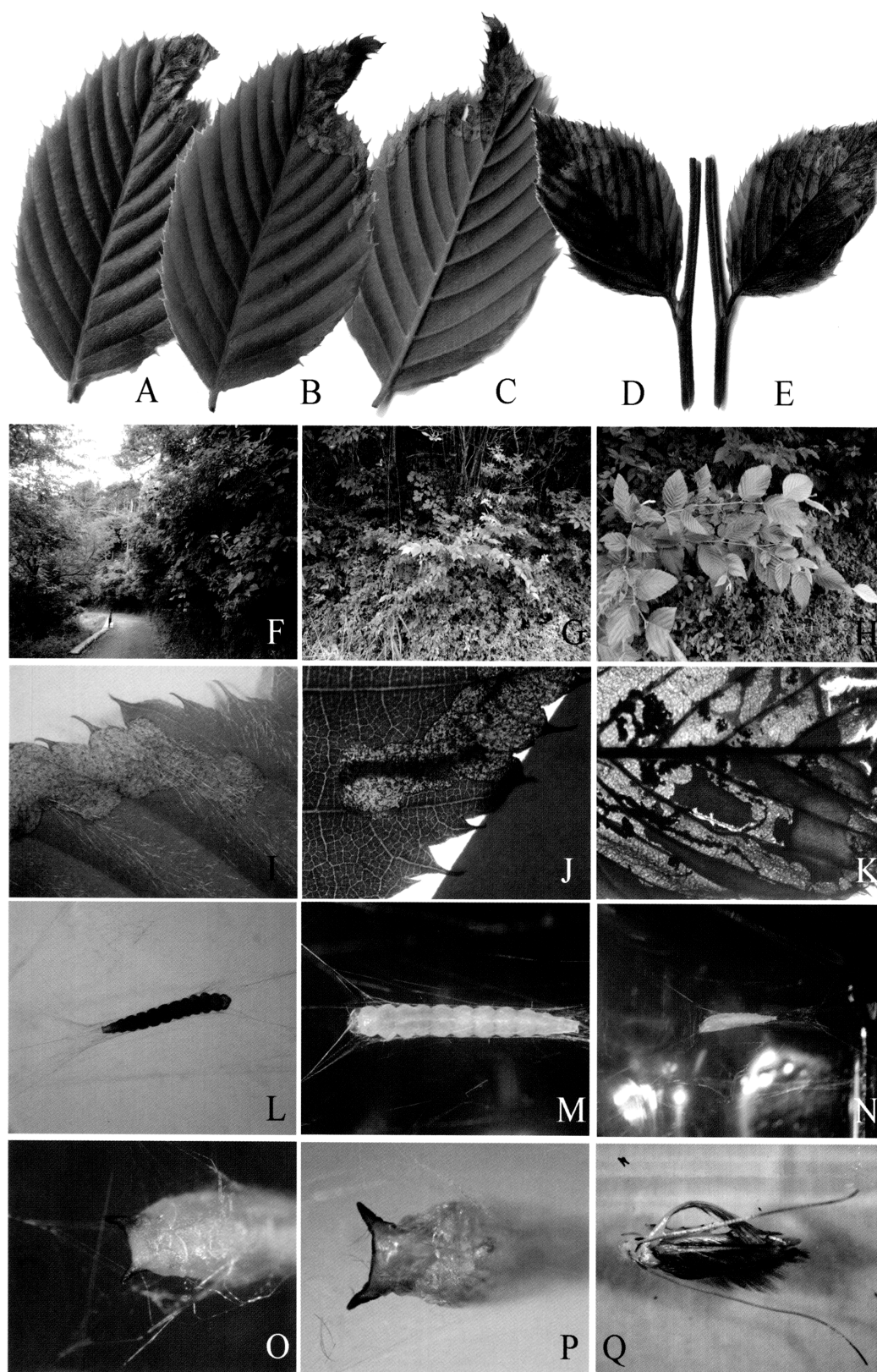


Fig. 5. Biology of *Lyonetia castaneella* and the hostplant, *Carpinus tschonoskii*. A-E: Mine developments by young to final instar larvae. J, K, L: Pictures taken with transmitted illumination of microscope. A: Young mine. B: Blotch mine by later larva, adaxial side of leaf. C: Abaxial side of leaf. D: Blotch mine widening to whole area of leaf, adaxial side of leaf. E: Abaxial side of leaf. F: Habitat, Konagao, Soni Village, Nara Prefecture, asl. 680 m. G: Hostplants, *C. tschonoskii* in habitat. H: Shoot of *C. tschonoskii* in habitat. I: Tip of mine. J: Later larva. K: Blotch mine and frass. L, M: Final instar larva spinning cocoon. N: Pupa and cocoon. O: Head of pupa, dorsal view. P: Same, ventral view. Q: Adult, failed to emerge.

## 摘 要

クリハモグリガ (ハモグリガ科) に関する生態学的知見 (小林茂樹)

原記載以降、ほとんど記録がなかったクリハモグリガについて分布、寄主植物、幼生期などの情報を追加した。

クリハモグリガ *Lyonetia* (*Lyonetiola*) *castaneella* Kuroko, 1964

本種はKuroko (1964)によって福岡県英彦山産の標本 (1954–1955年 黒子 浩採集) をもとに記載され、後に大阪府箕面産の標本 (1975年 齊藤寿久採集) が追加記録されたが、それ以降は追加記録がなく、幼生期はKuroko (1964) による記述のみの簡単な記録があるだけで詳細な報告はなかった。著者は、2015年8月中旬から10月中旬に奈良県曽爾村、三重県名張市においてイヌシデ (カバノキ科) とクリ (ブナ科) にそれぞれ潜るハモグリガ幼虫を採集した。当初は、先端が枯れた葉と思われたが、幼虫と糞粒が確認でき、羽化した成虫を検討した結果、交尾器の特徴などから本種と同定した。(原記載では、エデアグス先端の結節構造は小さく描かれているが、実際はエデアグスの長さの1/3に達する)。分布と寄主を追加すると

ともに、これまで報告がなかった幼虫の潜孔、蛹、マユなどの写真を図示した。

幼虫は、寄主植物の低い木の若い枝に発生し、柔らかい新葉のみでみられた。潜孔は不規則な斑状で葉の先端付近からやがて葉身全体に広がった。糞粒の一部は潜孔表面に開けた無数の小孔から排出された。イヌシデでは、糞粒は複数のかたまりで潜孔中に残され、排出は確認できなかった。幼虫は、一つの潜孔に1～3個体の幼虫が確認でき、孵化から7日程度で摂食を完了して潜孔を脱出した。葉の被摂食部分は萎縮して茶色く枯れたようになりやがて脱落した。これまで本種の採集記録が少なかったのは、発生が展葉初期の葉に限られること、古い潜孔が枯葉にみえることなどのためと考えられる。

寄主植物: クリ、クヌギ (ブナ科)、イヌシデ (カバノキ科) (新記録)、国外ではハンノキ (カバノキ科) が知られる。

分布: 本州: 大阪府、奈良県 (新記録)、三重県 (新記録)、九州: 福岡県; 国外ではロシア沿海州。

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